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PAIN FOLLOWING EVISCERATION MODIFIED BY CAUTERIZING THE INTERIOR OF THE SCLERA WITH CARBOLIC ACID.

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The report, in the May issue of this journal, of the paper of M. Panas on "Enucleation in Panophthalmitis," and its discussion by the French Society of Ophthalmology, prompts the offer of some observations relative to this subject.

From the report of Prof. Alfred Graefe (Halle), 1884, in which he advocates the substitution of evisceration (exenteration) for enucleation, I was led to adopt his conclusions, viz.:

1st. It is less likely to result in the development of septic complications in the brain, or other organs, on account of the remaining sclerotic barrier against the invasion of micro-organisms into the orbital cellular tissue.

2nd. A superior stump is thereby formed for the adaptation of an artificial eye. These advantages are to be weighed against the fact that the pain is greater, inflammation more active, and the period of recovery longer than when the simple enucleation is performed.

My experience in the first five cases of evisceration coin-

cided with that of numerous observers, viz., very considerable pain, requiring opium, and extensive general inflammation, swelling of the lids, and in some, extrusion between the lids, of the œdematous conjunctival folds.

In thinking over the cause of the production of pain, it occurred to me that it was due to the inflammatory irritation and pressure on the ciliary nerves, lying in grooves on the inner surface of the sclera.

Should this be so, it was conceived that they could be effectually anæsthetized by an application of pure carbolic acid, after the removal of the cornea and bulbar contents. In addition to this it was thought that besides the radically antiseptic effect of carbolic acid, a coagulum would be formed by its application which would close the vascular openings through the sclera, and further fortify this barrier against the escape of the microbes into the orbit or sheath of the nerve.

The first case in which it was applied was that of a ciliary injury followed by septic invasion of the vitreous. For three days the patient suffered intensely. On the fourth day the rnea and contents of the eye were removed, and by means of a cotton holder carbolic acid (95 %) was applied to the entire concave surface of the sclera. The eye was dressed moist, with a compress of carbolic acid 1-2 %, and this was changed frequently. Neither pain nor material swelling followed, and the healing was rapid. The patient left the hospital on the fifth day following the operation.

Since that time I have cauterized the sclera in the evisceration of not less than twenty eyes for various conditions, some in advanced suppurative panophthalmitis. Two of my colleagues, Dr. Cullimore, Atchison, Kansas, and Dr. Hargrove, Waverly, Ill., have had additional experience with the same results. The inflammatory process has often been active, resulting in much swelling of the lids, œdema and extrusion of the conjuntiva as before the use of the acid, but in no case has the patient suffered to any extreme degree. In case of swelling, application of compresses of hot carbolic acid 1-2% were applied, but morphia has exceptionally, if ever, been required.

If the happy experience which has fallen to my lot in the use of carbolic acid in evisceration is found to be uniform in the hands of those who have a wider field for observation, much suffering will be saved to the patient, and the principal objection to this operation as urged by Abadie, Meyer, and Panas, will have been removed.

The frequency of death from the migration of septic microbes following enucleation performed during the progress of suppurative panophthalmitis, is so great, that numerous observers have been obliged to report fatal cases.

The safety of evisceration in such cases has been sustained by a large experience, and to my knowledge, no fatal case has been reported.

The increased amount of pain over that following enucleation, which has uniformly been observed by numerous operators, is not to be weighed in the balance against the danger to life which is assumed as acknowledged.

Therefore, should the above observations on the effect of carbolic acid not be sustained by further experience, the argument of increased safety from evisceration must be regarded as no less conclusive against that of enucleation. Should extended experience, however, corroborate these observations regarding the analgesic effect of the carbolic acid, the reduction of the pain, thus accomplished, will remove even this objection to its general adoption.

A CASE OF ASTHENOPIA DUE TO ANÆSTHESIA OF THE RETINA.

BY DR. J. H. STEWART, ST. PAUL, MINN.

The following case is not by any means unique, but invested with more or less interest on account of its perplexing nature, and shows the importance of a thorough clinical history, even in a branch of medicine where the practitioner has the organ to be treated as completely under his observation as though he held it in his hand.

Frank F., aged 29 years, English, machinist, consulted me for the first time March 3, 1888.

About a year ago, when attempting to do fine work, he noticed the image would blur, and after a few moments "go out altogether," as he expressed it.

He had been under the care of a colleague of mine for some three months, who fitted him out with quite an ample supply of eye glasses (some seven pairs in all), none of which benefitted him in the least.

The trouble became more and more annoying; he now had to close his eyes for ten or fifteen minutes at a time in order to reproduce such images as fine lines on steel, letters and print of all kinds.

When his work was concluded for the day he underwent quite severe pain and frontal headache during the greater part of the evening.

His general health was very good, appetite excellent; he slept well; tendon reflex normal; no muscular tremors, and indeed he is quite sound.

I made a thorough examination with the ophthalmoscope, but was unable to find any error of refraction; there was, however, a slight flush over the face of both discs.

I also examined him for insufficiency (after Steven's method) with the greatest possible care, only to meet with negative results.

He did not use tobacco nor stimulants to excess, but I induced him to discontinue both; still the asthenopia harassed him.

Inquiring more particularly into the nature of his occupation, I found he was a "turner," working ten hours a day on a lathe, with his work revolving at the rate of fifty revolutions to the minute.

With his gaze fastened on a steel cylinder revolving at such a rate, and only relieving the strain on his eyes by pausing to set "calipers" to a fraction of a line, I was no longer at a loss to account for his trouble, and felt not a little chagrined by my own carelessness in not having detected it sooner.

I recommended him to take a week's rest under atropine, and at the expiration of that period to have his work changed from that of a turner to some other branch, which he did with the reward of being entirely relieved from his malady.

To my mind this was a case of asthenopia due to anæsthesia retinæ.

I am aware that this is a term that has been severely objected to by many prominent writers. In Dr. Herman Wilbrand's very able paper on Neurasthenic Asthenopia and so-called Anæsthesia Retinæ (*Knapp's Arch. Ophthal.*, v. XII, page 428), he says:

"Anæsthesia retinæ is not an independent disease, but is a local expression of a general nervous diathesis."

And by the twenty-four cases he cites this is pretty conclusively proven.

Wolfe, in his lectures on the eye, does not speak of it at all, but takes the ground with Donders that "asthenopia is always the result of latent hypermetropia," and claims it should be called "*Fatigue de l'accommodation.*"

Schweigger admits that such a thing may exist in a healthy person, but lays great stress on hysteria. Liebreich gives instances of obscurations of the field of vision, lasting from half

a minute to one minute, which he classes under the head of sympathetic irritation of the retina. Steffan speaks of cases nearer to the one I have given, and proposes the name "contraction of the field of vision, without anatomical lesion." Mauthner simply gives a few authorities on the subject, and says:

"The disease is characterized, on the one hand, by a diminution of the acuteness of central vision, and on the other by anæsthesia of the peripheral portion of the retina, so that the field of vision is concentrically contracted in a very uniform manner in all directions."

I have been unable to find in the works at my command any name under which I can reconcile myself to classify this case. It is a well established fact, that a person viewing from a car window a rapidly moving train in close proximity, will experience an asthenopia of greater or less duration when he attempts to resume reading or any near work.

What is such a phenomenon due to? Surely some embarrassment of the retina's function by direct irritation, independent of the nervous system at large.

TRANSLATION.

FRENCH SOCIETY OF OPHTHALMOLOGY.

The following interesting article and discussion are translated from the report of the *Archives d'Ophtalmologie* on the meeting of the French Society of Ophthalmology:

WHY IS IT SO DIFFICULT TO CURE DETACHMENT OF THE RETINA?

BY PROF. DE WECKER.

As well in ophthalmology as in general medicine, pathological anatomy guides our attempts to cure, and furthermore explains our success or non-success. It is true that empiricism only too often interferes with this natural manner of things. With regard to this point we need only contemplate what has happened and is as yet being done against a symptomatic affection, glaucoma, the therapeutics of which, if ever so happy, have their origin almost solely in empiricism.

Those who desire to get a little amusement and who want to know how far bad reasoning and want of logic can go, if it is wished to hide the truth at any price, need only read the recent articles by Leber on the history of iridectomy in glaucoma, and of Jacobson who has just given us new contributions to the theory of glaucoma.

As far as the therapeutics of detachment of the retina are concerned, we can neither say, that empiricism as yet has helped them much, nor, that the anatomico-pathological researches have given us indications which are capable of guiding us in our therapeutic attempts. We have surely a right to demand of

pathological anatomy the solution of at least one part of its task, that is, to explain to us, why in the treatment of detachment of the retina failures are in fact as yet almost the rule.

The unexpected results which the therapeutics of glaucoma had empirically given at an epoch even when the gross alterations produced by glaucoma had not yet been recognized, gave birth to the hope that the detachment of the retina might meet with an equal good fortune. In consequence, without much considering the anatomical basis of this malady and the mechanism which guides its evolution, operations have been devised and multiplied which proposed either to evacuate the subretinal fluid,or simply to copy the therapeutics of glaucoma.

It was instantly admitted that as soon as the sub-retinal fluid was evacuated, drained, aspirated, or led into the vitreous body, the retina would have nothing else to do but to quietly apply itself to its original support. Did the absence of any anatomico-pathological knowledge justify such an empiricism? Surely not; but having been so lucky in the cure of glaucoma, it was hoped, that, by modifying the process of evacuation, we might, by an equal chance, stumble upon the proper means of curing detachment of the retina.

In this a persistence has been shown which I think it is time to bring to an end, by first demanding of pathological anatomy to tell us why we have been so often deceived, and secondly, in what direction we have to make our further attempts.

The labors of Iwanoff, Leber and especially the intrinsic researches of Erik Nordenson, have not only shown us the pathological changes found in eyes that have been attacked by detachment of the retina, but also by what mechanism the retina becomes detached from its support. From these we can draw also the conclusions why it is so difficult for this membrane to become re-attached. It is actually possible to admit with Nordenson that the theory, that a retraction of the vitreous body is the original cause of the detachment, is well established.

Nordenson concludes with the following words: "Although H. Mueller had mentioned the detachment of the vitreous body, although Iwanoff had insisted upon the detachment of

the vitreous body as the forerunner of the detachment of the retina, and although Wecker had given it as his opinion, that the detachment of the retina was preceded always by the detachment of the vitreous body and a rent in the retina, one seemed to be little disposed to admit also the theory of shrinkage for the spontaneous detachments (of the vitreous body) which could be diagnosticated with the ophthalmoscope. It is the merit of Leber to have first demonstrated from an anatomical, experimental and clinical standpoint the retraction of the vitreous body and the rent in the retina by the formation of a spontaneous detachment (of the vitreous body) visible by means of the ophthalmoscope."

I have by no meass the intention to go here into the details of pathological anatomy to discuss whether the retraction of the vitreous body plays an exclusive role, or whether a wrinkling of the vitreous body does not also happen in a series of cases. What I want to state here especially as being established by the most competent anatomical researches, as those by Leber, Nordenson, Haensell and others, are the following facts:

That the detachment of the vitreous body precedes that of the retina.

That the detachment of the vitreous body may exist without inconvenience if it is limited to the posterior segment of the eyeball; as soon, however, as the detachment of the vitreous body reaches the equatorial region of the eyeball, so soon the antagonism begins between the vitreous body, which retracts, and the retina, which is normally more adherent in this region. A detachment of the retina becomes, therefore, the more threatening the farther the detachment of the vitreous body advances toward the neighborhood of the equator.

That there always exists an adhesion between the retina and the vitreous body (retracted or wrinkled), and that the retina is detached as soon as a rent is produced at one of the points of adhesion to the vitreous body. It is especially important to note that the adhesion to the rest of the vitreous body remains persistent, although the fluid accumulated in front of

the retina may have by means of such a rent got behind and in consequence have detached the nervous membrane. Furthermore, in simply evacuating this liquid toward the outside, or in trying to make a way for it into the vitreous body or in front of the retina, by an artificial opening, we in no way change the pathological adhesion of the retina to the vitreous body, and we put no obstacles in the way of the progress of the evil if the vitreous body keeps on retracting, or is still more wrinkled.

It is, then, the pre-existing pathological adhesion between the retina and the vitreous body which holds the nervous membrane fast, and which does not give way, let our method to evacuate the subretinal fluid be ever so ingenious. It is this adhesion which renders our operative attempts futile if they aim solely at such an evacuation.

Let me conclude. If we want to obtain a real cure of the detachment by operative means, we must first aim at detaching the retina from the detached vitreous body, and so to make it impossible for the nervous membrane to be forced to accompany the vitreous body in its forward march. What difficulties the solution of this problem presents all those will find out who, with me, would be willing to make any effort. Similar involuntary attempts in the primitive operations of von Graefe and Bowman have sometimes been crowned with success, and, I believe, as also does Leber, that it is probable that in these happy operations the adhesions were accidentally broken in the manœuvre which had for its object the formation of an artificial opening in the retina.

Discussion.

Boucheron.—You just have heard the theory,that the detachment is preceded by an affection of the vitreous body, upheld by Mr. DeWecker with great ability. Please allow me now to speak in defense of the opinion, that an affection of the uveal tract (ciliary body and choroid) is the most frequent cause of the so-called spontaneous detachment of the retina, and, that the affections of the vitreous body help only to ag-

gravate the detachment without playing the principal active part in its production. When the detachment is seen at its beginning, it is situated in most cases—and that is a very important point—in the upper portion of the eyeball. I here remind you of the recent observation of Gaupillat. As the fluid by its weight gradually descends toward the lower portion of the eyeball, the upper portion of the retina which was first detached becomes spontaneously re attached, at least if the quantity of fluid is a moderate one.

The primary seat of the detachment in the upper portion corresponds to a lesion of the ciliary body, localized upward in the great majority of the cases. Why, I do not know. This cyclitic lesion, a mild cyclitis, is proven symptomatically by a slight pain on pressure with the finger, and by floating opacities in the vitreous body.

In fact the ciliary body, which is inflamed (generally in consequence of rheumatism), exudes a fluid which contains a great deal of fibrogenous material, and its coagula form the floating opacities in the vitreous body. When this inflammation spreads in the neighboring choroid the resulting exudation produces a detachment of the retina. The pressure of this exudation forces the retina inward, and, in doing so, pushes the vitreous body back, the fluid portions of which escape by the excretory channels which have remained open. The pressure of this cyclo-choroidal exudation is renewed periodically, as is the case with rheumatism in other regions. In this way the sub-retinal fluid increases in quantity, or is re-produced after having been absorbed. The vitreous body thus being pushed back by the detached retina, encumbered with fibrinous floating opacities, ready to become organized, its fibres become shorter and contract. When this contraction is once produced, the retina follows it and can no longer return to its normal position. In order to accomplish this it would be necessary, as in the operation of Létiévant and Estlander on the thorax, to press the shell of the eyeball towards the retina and the contracted vitreous body.

It is, therefore, impossible to cure a detachment, except in

its beginning, before the contraction of the fibres of the vitreous body has taken place, and on condition, that no new exudation takes place by any further cyclo-choroidal or cyclitic attacks. The rents in the retina do not as a rule lie upward, but downward, or to the side, and we must, therefore, in most cases consider them as caused by a necrosis in consequence of bad nutrition, due to the detachment of the retina, or as caused by the pressure of the exudation.

This proves them to be secondary and not primary occurrences. Pathological anatomy has furnished us with positive facts only in cases of very recent detachment, when only primary lesions are found, as for instance in cases of incipient sarcoma of the ciliary body. In these cases, as far as my studies teach, we find only a cyclo-choroidal exudation, but neither a rent in the retina nor a detachment of the vitreous body; on the contrary, in cases in which the detachment is old or in important experimental lesions (injection of cantharidine [Boucheron], or naphthaline [Panas] into the supra-choroidal space) the exudation passes through the retina in different places, and may in this manner detach the vitreous body. Such lesions are due to the greater intensity of the process, or they are of long standing.

Abadie.—I am sorry I cannot agree with my eminent teacher, Mr. DeWecker, on a question of such importance, and I am astonished that he, who has done so much for ophthalmic surgery, seems to despair of curing the detachment of the retina. I do not think, that pathological anatomy is apt to clear up the pathogenesis of this disease, because the eyes which have been enucleated in consequencc of detachment of the retina, present, so to speak, terminal lesions which are the consequence of the disorganization of the eyeball, instead of being its cause.

From a clinical standpoint it is difficult to admit, that it is the contraction of the fibres of the vitreous body which causes the detachment of the retina, because we see the detachment taking place in myopic eyes with absolutely normal media, and which, the day before, presented no functional trouble, no

alteration that could be distinguished with the ophthalmoscope. It seems to me that in myopic eyes the true mechanism of the detachment is a totally different one. Let me ask in what point myopic eyes differ from others. It is in the elongation of the antero-posterior axis. The elasticity of the tissue of the sclerotic allows of its distension, it is, therefore, not the retina which becomes detached. When a puncture is made the retina becomes reattached for several days, and then is again detached. Why? Because on the one hand no adhesions have been formed, and on the other, the sclerotic which had in some measu e returned to its normal shape after the evacuation of the fluid, begins again to become distended.

In order to insure a cure it would then be necessary, first, to obtain an adhesion of the retina at the place of puncture, and, second, to prevent effectually the distention of the eyeball. I have tried to obtain this double end in the following manner: Before making the puncture I perform sclerotomy, thus allowing the eyeball to contract and to maintain a reduced intra-ocular pressure. In the second place I produce a local irritation at the site of the puncture. The delicate point here is, not to let this irritation go beyond a certain measure. I have once injected one drop of Piazza's fluid. The result was satisfactory. When I tried to increase this dose, and injected three drops, the affection became aggravated.

Sclerotomy combined with simple puncture yields more lasting improvements than all other procedures.

Gorecki.—I am absolutely convinced that the term detachment of the retina has been applied to a number of very different pathological conditions. I only remind you of the discussion which we had here two years ago. A certain number of our colleagues stated that they had seen and, what is more, had cured within a few days a great many cases of detachment of the retina by pilocarpine, iridectomy, galvanocautery, etc. At that moment it seemed as if there was nothing more easy than to cure a detachment of the retina, and we who could not succeed in getting such beautiful results, looked around for an explanation.

The inquiry which you have instituted has brought about a juster view of these facts, and of such a hope of an easy cure for detachment of the retina, and we now know, that we have to eliminate a certain number of cases as false detachments. But, even if we speak only of real detachments of the retina, we have to distinguish between detachments which are the consequences and, so to speak, the height of different pathological processes, and secondly, those which, on the contrary, are their beginning. These two different kinds of detachments must necessarily call for a very different treatment and prognosis. It is impossible to uphold the idea that all detachments of the retina are produced by contraction of the vitreous body. We have to deal with two affections which are distinct, at least for a short period; namely, first, the detachment of the vitreous body, and, second, the detachment of the retina. One remark made by Mr. DeWecker is perfectly correct, namely, the one stating, that equatorial lesions render the prognosis more grave. A limited posterior detachment may become cured, when, on the contrary, it has reached the equatorial region, it will never recede. The same is the case with a traumatic detachment.

Meyer (Paris).—There is one point in Mr. DeWecker's communication which, it seems to me, ought to be cleared up, namely, what is the relation between the detachment of the vitreous body and the detachment of the retina. If I have understood our colleague well, he thinks, that in future our surgical attempts must aim at prohibiting the retina from following the contraction of the vitreous body, or at separating the adhesions between the vitreous body and the retina, which latter, he thinks, becomes more and more detached as the contraction of the vitreous body progresses. It seems to me it would be necessary to be first sure that such adhesions exist. On the other hand, it would follow from DeWecker's communication that the affection begins with a large detachment of the vitreous body. Now, in order that such a one can be produced, it is necessary that the vitreous body, far from being adherent to the retina, be detached from it; since if the

retina, being adherent to the vitreous body, follows it in its contraction, we can no longer speak of a detachment of the vitreous body, and we have to deal with a detachment of the retina.

De Wecker.—In my answer I shall of course only speak of true detachments, and not of the false ones to which Mr. Gorecki had reference. It has been established for a long time, that detachments of the vitreous body precede those of the retina. What is new, and what Leber and Nordenson have well established, is the constancy with which alterations are found in the vitreous body. To Mr. Abadie I have to say, that even if the vitreous body appears transparent, it is by no means proven, that it is not diseased. On the other hand I have to add, that if we are but seldom able to see the rent in the retina, it is because it generally lies very peripherically, or it may be hidden by a fold of the detached portion. Histological researches, furthermore, have demonstrated the constancy of a rent in the retina. I certainly come back to my former conclusion, and I want to advise my collegues to renounce all operative procedures ordinarily in use, and to take up new procedures inspired by more recent histological researches.

AMERICAN OPHTHALMOLOGICAL SOCIETY—24TH ANNUAL MEETING HELD AT PEQUOT HOUSE, NEW LONDON, CONN., JULY 18 AND 19, 1888.

WEDNESDAY, FIRST DAY.—MORNING SESSION.

The Society was called to order by the President, Dr. W. F. Norris, of Philadelphia. The deaths of Dr. C. R. Agnew, Dr. E. G. Loring and Dr. Joseph Aub were reported.

Dr. H. D. Noyes, New York, read a memorial of the late Dr. C. R. Agnew.

Drs. W. H. Carmalt and C. S. Bull were appointed a committee to prepare an appropriate minute in regard to the death of Dr. E. G. Loring, and Dr. Chas J. Kipp was appointed to prepare a similar minute in regard to the death of Dr. Joseph Aub.

The members of the American Otological Society were invited to take seats with the Society. The following gentlemen were invited to take part in the discussion, Dr. Koller (Vienna), Dr. Skinner and Dr. Nodine.

A Contribution to the Treatment of Membranous Opacities in the Vitreous, by Dr. C. S. Bull, New York.

These opacities in the form of membranes or shreds are rarely freely movable, and usually resist internal treatment. Operation by incision with a needle was first performed by Von Graefe. In the experience of the writer the operation had been found useful. Some opacities as a result of hæmorrhage or inflammation of the choroid sometimes respond to internal remedies, but as a rule they fail. By incision of the membrane a direct improvement of vision may be obtained and the process of absorption may be stimulated. Posterior opacities are more easily reached with less danger to the lens, and with more favorable results than in the case of anterior

opacities. The author has done this operation in seventeen cases of chronic membranous deposits in the vitreous. In some cases the ordinary discision needle was used, in others a broader needle, and in a few a slender cataract knife. Cocaine was employed in all cases. The point selected by preference for the introduction of the needle was just in front of the equator of the eye and below the insertion of the external rectus muscle. There seems in this operation to be no danger of loss of vitreous through the small opening, nor is there danger of hæmorrhage. The puncture should be posterior to the ciliary process and pressure with the forceps should be avoided. Little or no reaction follows the operation as a rule. A protective bandage is required only a few days. Antisepsis was employed in all cases.

The details of the seventeen operations on fifteen patients were given. Fourteen showed decided improvement in vision. There was no loss of vision from the operation in any case. The operation is appropriate in certain cases, but it is wise to wait until all inflammatory symptoms have subsided before attempting any operative procedure. The eye should be absolutely free from all irritation before surgical interference is attempted.

Discussion.

Dr. W. F. Mittendorf, New York.—I think that vascularity of the vitreous membrane should always speak against operations of this kind. Vascularity, even if all inflammatory signs have subsided, points to a fatal prognosis.

A Case of Pulsating Exophthalmos cured by Ligation of the Common Carotid by Dr. F. Buller, Montreal.

Pulsating exophthalmos occurring spontaneously or as a result of traumatism is rarely met with. The pathology is so well understood, that little remains to be done in this direction at the present time. In the matter of treatment, there is no rule so firmly established that much must be left to the judgment and discretion of the surgeon.

The author had seen four cases of this affection. In the

first the condition followed a blow upon the head. Some months after the appearance of the pulsating exophthalmos, ligation of the carotid was performed, but the patient died in the course of a few weeks from repeated attacks of epistaxis.

The second case has been already reported.

In the third case the affection followed a blow on the brow from a piece of iron. The patient was seized with severe epistaxis, and died in a few minutes. There was found a depressed fracture of frontal bone with a fissure extending across the orbital roof and body of sphenoid bone directly beneath the cavernous sinus. As a result of caries of the bone there was a direct communication between the nasal cavity and the internal carotid artery.

The fourth case, the subject of the paper, came under observa- May 24, 1888. A young man, aged 28, fell a distance of 20 feet, striking the right side of the head, rendering him unconscious for 24 hours. After the swelling had subsided the patient noticed diplopia, one image being higher and less distant than the other. There was also a loud beating sound in the right ear. Two weeks before coming under observation, prominence of the eye was noticed. There was still diplopia, the higher image moving up and down with each heart-beat. Four days before coming under notice, the pain became intense. On examination there was at the inner extremity of the right brow a swelling which imparted a distinct thrill to the fingers. There was also a harsh bruit. Pressure over the common carotid diminished the intensity of the thrill, and lessened the pulsation.

It was decided to ligate the common carotid in the upper part of its course, and this was done May 25, two ligatures being applied, and the vessel divided between them. The immediate effect was softening of the swelling, partial reposition of the eye-ball, great diminution in the pulsation and disappearance of the bruit. The patient made a good recovery and left the hospital with very little prominence of this eyeball: V. $=^{20}/_{xx}$; movements normal.

Pulsating Exophthalmos, by Chas. J. Kipp, Newark.

A lady, 76 years of age, presented herself with the history, that shortly after striking the head in a fall, she noticed noise in both ears, followed by protrusion of both eye-balls, the right $^{4}/_{10}$ inch; the left $^{2}/_{10}$ inch. There was no marked pulsation but there was a thrill, and a bruit could be heard over the anterior half of the head. This could be arrested by compression of the right carotid, and partially so by compression of the left carotid. In view of the age of the patient, no radical measures were recommended, but it was suggested that pressure be made on the right carotid as often as convenient. Iodide of potassium was also given. Three months later the patient stated that the noise had suddenly disappeared. This was followed by disappearance of the exophthalmus, first in the left eye and subsequently in the right. The external appearance of the eyes is now normal. There is, however, a marked pulsation of the right sub-clavian artery, but no aneurism can be discovered.

Discussion.

Dr. S. D. Risley, Philadelphia.—I would call attention of the Society to the fact that Dr. Harlan reported a case of this kind cured by compression, and that I also reported a case in which compression of the vessels for a short time was followed by disappearance of the symptoms and subsidence of the exophthalmos.

An Analysis of 576 Cases of the Refraction of Healthy Human Corneæ, Examined with the Ophthalmometer of Javal & Schitõz, by Dr. Swan M. Burnett, Washington.

These 576 corneæ belonged to 301 persons examined within a little over a year by Dr. Burnett. Pathological states of the cornea were excluded for consideration at another time. The corneal refraction was found to be the same in both eyes to within 0.25 D. in 110 persons. The horizontal meridian (to within 5°) was the least refractive (astigmatism according to the rule) in 420 eyes. The vertical meridian was the least refractive (astigmatism against the rule) in 20 eyes. In 88 eyes the meridians were oblique. In 58 eyes the difference in the refraction of the two meridians was less than .25

D. In 101 eyes there was emmetropia. The largest number had a corneal refraction of from 44 D. to 45 D.; the next largest from 43 D. to 44 D. The strongest corneal refraction was 47 D., the weakest 39 D. In 55 eyes there was simple myopia. The strongest refraction in the weakest meridian was 47.25 D.; the weakest 39 D. The corneal refraction did not in any considerable number of cases bear any close relation to the degree of the myopia. Simple hypermetropia was present in 59 eyes. Weakest refraction in the weakest meridian was 40.5 D., the strongest, 46 D. As in myopia the corneal refraction was no indication as to the degree of general hypermetropia. Myopic astigmatism was found in 140 eyes. In 4 eyes the general astigmatism was greater and in 11 it was less than the corneal. In 14 eyes the difference in the axes of the corneal membrane and that of the prescribed glasses was greater than 5°. Hypermetropic astigmatism was present in 96 eyes. In 4 eyes the corneal astigmatism was greater and in 2 eyes it was less than the general. The axes corresponded in all but 9 eyes. Compound myopic astigmatism existed in 63 eyes. In all but 7 eyes the corneal and general astigmatism corresponded, and in 44 eyes the axes corresponded. Compound hypermetropic astigmatism was found in 55 eyes. In 31, corneal and general astigmatic meridians corresponded. The corneal and general astigmatism was the same in all but 4 eyes. Mixed astigmatism was present in 8 eyes; in 4, the corneal and general astigmatism was the same; in 2, the corneal was less and in 1 greater than the general. Corneal and general astigmatic meridians were the same in 5 eyes.

In 42 eyes the general astigmatism was against the rule, while in only 18 of these eyes was the corneal astigmatism against the rule. From examinations under a mydriatic, the author felt himself warranted in thinking that many cases of lenticular astigmatism are due to an oblique position of the lens.

Corneal astigmatism is, with very few exceptions, according to the rule (vertical meridian the stronger). From a study of these statistics the author feels warranted in concluding that

while the corneal refraction gives no indication of the general refraction of the eye, its astigmatism in the vast majority of cases, expresses the general astigmatism both as to degree and direction of its axis, and considers, therefore, the instrument of Javal and Schiötz one of, if not the most important, instrumental means for the diagnosis of the anomaly. He does not think astigmatism more productive of progressive myopia than any other form of ametropia.

DISCUSSION.

Dr. H. D. Noyes, New York.—I have used the ophthalmometer of Javal and Schiötz with great satisfaction. In the immense majority of cases the evidences of the ophthalmometer without the use of atropine have corresponded with the evidences of the trial case. The amount of astigmatism and in a general way the axis of the astigmatism is obtained. The use of this instrument has led me to believe that mixed astigmatism is more common than we usually imagine. I have also noted the influence of the eyelids in altering the curvature of the cornea. I have also satisfied myself that the tension of the eye-muscles modifies the curvature of the cornea. I have also noticed in some cases a pulsation of the corneal reflex due to the fact that the cornea was so thin that the circulation of the eye impressed itself upon it. This I have seen particularly in conical cornea. The use of this instrument does away to a large extent with the necessity for the employment of atropine.

Dr. Sam'l Theobald, Baltimore.—I infer that the author thinks, that when a mydriatic is employed, the lenticular astigmatism is done away with. My experience leads me to believe that the asymmetrical condition in the lens does not at once disappear on paralysis of the ciliary muscle. I think that the discrepancy between the total and general astigmatism may often be accounted for by this persistent asymmetrical condition of the lens. This condition gradually disappears after suitable glasses are worn.

Dr. B. Alex. Randall, Philadelphia.—I cannot agree with the author that simple astigmatism is so common and pre-

dominates over other forms. Taking the records of the Hospital of the University of Pennsylvania for the last ten years I find 4000 refraction cases, determined, almost without exception, under a mydriatic. Compound hypermetropic astigmatism constituted about 40% ; compound myopic astigmatism constituted 30% ; simple myopia and hypermetropia about 8% and 12% respectively. Mixed astigmatism only about one or two per cent. Compound astigmatism constituted at least 70% of the total number of cases.

Progressive Hypermetropic Astigmatism, was the title of a paper read by Dr. J. B. Emerson, New York.

Dr. Edward Jackson, Philadelphia, exhibited a new form of cataract knife. It was designed to combine the advantages of the Graefe and Beer knives. The point, resembling that of the Graefe knife, allowed the puncture and counter puncture to be made in the same way as with the Graefe knife, whilst the rest of the blade having the shape of Beer's knife, enabled one to complete the incision as with that instrument. With it the puncture and counter puncture are completely under control, the flap is completed at a single thrust, the aqueous is not lost until the incision is nearly finished, and the counter-pressure of the back of the knife assists in steadying the eye.

Dr. J. O. Tansley exhibited the following instruments:

An improved lachrymal syringe, in which the nozzle ends in a closed bulb, the openings being on the sides of the tube.

A clamp to prevent the passage of atropine solutions through the lachrymal duct into the nose in cases where the free use of atropine is called for.

An improved lachrymal probe and improved style.

Dr. Sam'l Theobald, Baltimore, exhibited probes made of aluminium.

Œdema of the Choroid and Retina, by Dr. Edward Jackson, Philadelphia.

The author reported the case of a young man struck in the eye with a marble or small stone, causing a bruise of the eyeball. The ophthalmoscope showed localized swelling of the choroid and retina at the posterior pole of the eye; the cho-

roidal spots having the usual grouping of ruptures of the choroid in this region. These spots disappeared in about a week. There was also at first some 0.75 D. myopic astigmatism which gradually diminished, and in three weeks entirely disappeared leaving the sight perfect.

Symptomatic Myopia, by W. F. Mittendorf, New York.

But little attention has been called to myopia as a symptom of various affections of the eye. Three forms of myopia may be spoken of viz. axillary, refractive, and symptomatic. The latter form may be caused by traumatism, but more commonly by diseased conditions. It may be produced by displacement of the lens forward. More frequently it is due to swelling of the lens accompaning beginning cataract. This is sometimes relieved by the use of concave glasses; very strong glasses being occasionally required. Plastic exudations may also cause myopia, but these usually so interfere with vision that it is impossible to demonstrate the existence of myopia. Glaucoma, serous choroiditis and iritis are frequently accompanied with myopia as a symptom. A number of illustrative cases were cited. In these cases the myopia is not permanent, but as the disease disappears, the myopia passes away, leaving the refractive condition of the eye the same as before the attack.

Discussion.

Dr. J. O Tansley, New York.—Some years ago I reported a case of localized exudative choroiditis just beneath the macula with myopia. The myopia gradually increased as the attack reached its height, and as the inflammation subsided, the myopia passed away.

Dr. Carl Koller, Vienna.—I think that in these cases of myopia in iritis the condition may be due to the irritation of the ciliary muscle. There is hyperæmia of the ciliary body, and as the pupils are contracted, it is to be supposed that the ciliary muscle is also contracted. Although atropine may be used there is not full dilatation of the pupils. It is, therefore, reasonable to suppose that the myopia is the result of spastic contraction due to inflammation.

Dr. S. D. Risley, Philadelphia.—In a few instances it has

seemed to me that in these cases of iritis and choroiditis the myopia was due to the dread of light and the cramp of the lids.

Dr. John Green, St. Louis.—In two attacks of iritis, of which I was myself the subject, I carefully studied this myopia. In my case the eyes were completely under the influence of atropia. The pupils were dilated and the ciliary muscle paralyzed.

EVENING SESSION.

Hysterical Blindness in the Male, with a report of three cases, by Dr. Willam Oliver Moore, New York.

The average proportion of cases of hysteria in the male to hysteria in the female is 1 to 15.

CASE I.—Male, æt. 25, farmer, family history good. During past two years had suffered with nervous symptoms. Did not smoke or drink, In June '86, complained of failing vision in left eye. When seen June 16, according to patient's own statement vision in left eye=0. In right normal. Ophthalmoscope showed normal fundus except a slight notch of opaque nerve fibres near the papilla. Testing with prism and candle gave double vision as did pressure on one eye-ball. The patient was informed that treatment by electricity would cure him in a few days. A reverse faradic current was applied, causing the patient to jump from his chair exclaiming that there already was an improvement. In ten days $V=^{20}/_{xx}$, emmetropic.

CASE II. Male, æt. 22, student and farmer, fine looking. History of insanity in the family. Eighteen months previous to coming under observation atropia had been instilled by a physician to determine whether or not glasses were required. He thought from the effect of the atropine that he was going blind. He then put on smoked glasses, subsequently bandages and kept in a dark room. He would not open the lids and declared that he was blind. For ten months he kept in a dark room with covering over the eyes. On examination the lids were closed but not by spasm; the cornea clear, V=0. Ophthalmoscopic examination under ether, normal fundus. Hys-

terical blindness was diagnosed, and a favorable prognosis given. Canthoplasty was then performed. Coming from the ether the patient opened his eyes and evidently saw clearly. He was told that the cause of the disease had been discovered and that he would be well in a few days. In two days he was walking around without glasses. Has remained well since.

CASE III. Boy, æt. 15. Developed blindness in right eye after a disappointment at school. Normal appearance of eyes. Tests with prisms and colored glasses showed that vision was present. Ether was administered and patient assured that he would be well and under electricity recovery was rapid.

Description of a Series of Tests for the Detection and Determination of Sub-Normal Color-Perception, (Color Blindness) Designed for Use in Railway Service, by Dr. Charles A. Oliver, Philadelphia.

It is a well known fact, both from theoretical and practical stand points, that many "color blinds", especially those of medium grades have the power of differentiation even by daylight of the most difficult colors when placed at ordinary metre distance of wool selection employed in the detection and determination of "color blindness". The writer has been induced through a hope to overcome the dangers that might arise from this power in situations, such as railways, marine, and naval service, where the safety of lives and protection of property is oftentimes solely dependent upon proper recognition of color at great distances, and frequently through the intervention of more or less translucent media, to combine two modifications of his method of color selection to a simplified plan of the former procedure by which the candidate is placed in the actual position of after-work and under exactly similar circumstances as during employment. The method is divided into three parts.

First. The selection and registry of a definite number of loose wools from 23 pure and confusion match skeins thrown upon a dead black surface at one metre distance.

Second. The selection and registry of the same number of similar reflected colors under various intensities of diffused daylight stimulus, placed at distances requisite for safety.

Third. The selection and registry of transmitted colors under various intensities of artificial light stimulus placed at distances requisite for safety.

In addition to the advantages shown refer to the first test alone. The method has the following additional ones.

(1) Much faster in time than any other method; (2) The selection of loose wools at a distance; (3) No necessity for an expert except in doubtful cases; (4) Employment of the same character of signals for testing as is used in daily routine; (5) Placing the eye during testing at a distance necessary for future safety; (6) Bringing the eye during testing directly before the true condition of weather experienced whilst it is upon duty; (7) Test and match colors all graduated in proportionate sizes.

Case of Embolism of the Central Retinal Artery, by Dr. Charles A. Oliver, Philadelphia.

The patient, a young man, was seen October 5, 1887. Twenty-six hours previously, while walking in the shade, he was suddenly seized with blindness in the left eye. There were no other symptoms, and there had been no previous illness. The right eye was normal, Ophthalmoscopic examination of left eye showed clear media; nerve substance of a grey tint and swelling of the retina. All the retinal vessels were reduced in size. The veins were somewhat contracted especially toward the nerve entrance. The characteristic cherry spot in the macular region was distinct. There was a small hæmorrhage out from the disk. Careful physical examination failed to reveal any lesion in other parts of the body. The case was kept under observation for some time, but there was no return of vision, the patient remaining completely blind in the left eye.

DISCUSSION.

Dr. H. D. Noyes, New York.—The result of autopsies shows that the great majority of these cases are really due to thrombosis and not to embolism.

THURSDAY, SECOND DAY.—MORNING SESSION.

A case of Double Congenital Irideremia in a Child whose Mother Exhibited a Congenital Coloboma of each Iris, by Dr. Sam'l Theobald, Baltimore.

James O., æt. 18 months, was seen Dec. 9, 1887. His mother brought him on account of the red appearance which the pupils presented. Upon examination, besides a congeninal squint of the left eye, complete absence of each iris was discovered. The lenses were clear, and there seemed to be, at least in the right eye, fairly good vision. The interest of the case lies in the fact, accidentally discovered, that there existed in the mother a congenital coloboma of each iris. In her right eye the coloboma was large, its direction being directly upwards; in the left eye it was somewhat smaller, and was in an upward and outward direction. In neither eye was the choroid involved in the congenital defect. The mother volunteered the statement that an older child had had a similar appearance of the eyes, so that it is probable that to this mother with congenital coloboma, there were born not only one but two children with absence of the irides.

Discussion.

Dr. David Webster, New York.—I think that the direction of the coloboma in the mother's eye was unusual. I have seen a number of cases of congenital coloboma of the irides, but I do not recall an instance in which the coloboma was upwards. It is almost always downwards.

Dr. B. Alex. Randall, Philadelphia.—Having had occasion to look up the literature of this subject, I can say that there is a number of cases reported of coloboma inwards or outwards, but not upwards. This case seems to be unique in this respect.

Puncture of the Retina for Detachment, by Dr. T. Y. Sutphen, Newark, N. J.

The results of three operations were reported.

Case I.—A male, 62 years of age, sought treatment April 1, 1887, for a cloudy appearance before the right eye. This he had noticed only a few days. He was near-sighted, but had never used glasses. Examination. R. V.=$^{15}/_{c}$, raised to $^{15}/_{xx}$. by $-^{1}/_{16}$. Field of vision defective downwards and toward the median line. Tension slightly diminished. L. V.=$^{15}/_{c}$, raised to $^{15}/_{xv}+$ by $-^{1}/_{16}$. Ophthalmoscope showed myopia

with choroiditis in both eyes. In the right eye the retina was found detached in its upper and temporal portion. The patient refused to undergo vigorous treatment in bed. He was given iodide of potassium in gradually increasing doses, rest being enjoined.

Five months later the patient returned with commencing detachment in the upper and temporal portion of the left retina. He was then kept in bed for two weeks with the eyes bandaged, while profuse diaphoresis was frequently induced, but without benefit. He was then sent to the country, the iodide being continued. By Dec. 1, there was in the right eye only perception of light; in the left there was vision confined to the outer and lower field. On this date puncture of the retina from beneath the detachment was made. Thorough antisepsis was employed; cocaine was instilled. A sickle shaped needle was thrust into the globe between the insertion of the external and inferior recti muscles, on the equator and on a plane with the lens, it was pushed onward until it was thought that the retina had been pierced. It was then withdrawn with a sweeping motion, the object being to enlarge the opening in the retina. Atropine was instilled, the eyes bandaged and the patient ordered to keep quiet. The following day, the subretinal fluid had disappeared, field of vision was normal, a red reflex was obtained from the fundus in every direction and the patient could distinguish large objects. Bandage was reapplied. Two days later patient could count fingers at twelve feet, the retina appeared in its normal position but the vitreous was quite cloudy. The vision continued steadily to improve. Dec. 10, a similar operation was performed on the left eye. Two days later there was marked enlargement of the field of vision but some detachment was still to be seen on the temporal side. Dec. 16, field of vision in both eyes normal. No detachment of retina in either. The patient remained in bed 28 days. Feb. 10, detachment began to reappear in the left eye and by March 3d it was as great as before. Needling was again performed with the escape of very little subretinal fluid. March 5, field again normal. April 1, partial return of detachment in

left eye. July 6th, seven months after first operation R. V.= $^{15}/_{C}$ raised to $^{15}/_{XL}$ by $-^{1}/_{20}$, no return of detachment, field of vision normal, blindness for red. In the left eye almost complete detachment of the retina.

After referring to the history of the operation, the speaker said that the interesting facts were these: the apparently perfect safety of the operation under the modern antisepsis; one success and two failures under exactly similar conditions, barring the escape of the fluid outwards in the successful case; encouragement to try this operation in otherwise incurable cases; the absolute freedom from all reaction. The best results will probably follow where the operation follows closely upon the subsidence of the acute affection causing the detachment. The chances of success are increased by a free flow of fluids outwards. It was suggested that a narrow Graefe knife might be used after accurately measuring the depth of the detachment, provided the point be so directed that the wound in the retina shall be directly opposite the scleral puncture.

Discussion.

Dr. J. L. Noyes, Detroit.—I have tried operative procedure in only one case. I drew off the fluid with a hypodermic syringe. After drawing off the fluid the retina returned to its normal position and the outline of a small tumor was discovered. The detachment soon returned: the ball was enucleated one year later.

A Case of Glioma, by Dr. F. P. Capron, Providence.

The patient was a child $3^{1}/_{2}$ years of age. The growth was removed, but has since involved the submaxillary glands and the glands in the neighborhood of the ear. Photographs showing the appearances, were presented.

Discussion.

Dr. D. B. St. John, Hartford.—I would ask whether aid in the diagnosis between glioma and other affections is obtained by attention to the state of the tension.

Dr. David Webster, New York.—I think that I have never been able to detect any increase of tension until the second or inflammatory stage has been reached. Then there is always,

I think, increase of tension. In at least two cases, I have diagnosed glioma from the history with the existence of increased tension, when a tumor could be discovered. There is now on record a case in which Dr. C. R. Agnew removed both eyes of a child one year of age, for glioma. This was fifteen years ago, and the individual is still living. In this case the diagnosis was verified by microscopical examination. In some cases where the diagnosis was made, but enucleation refused the patients are still alive and the disease has not progressed, retrograde metamorphosis having, it is said, taken place.

The President, Dr. W. F. Norris.—My impression is that in true glioma, retrogressive metamorphosis does not take place. Fatty degeneration may occur in parts of the growth, but I am not aware of a case in which the growth entirely disappeared. Such cases are, I think instances of mistaken diagnosis. The diagnosis is difficult unless the growth has reached such a size that the vessels may be seen in it.

Models Exhibiting Refraction by Cylinders, by Dr. Swan M. Burnett, Washington.

It was shown how the refraction and focal line change with the variation in the strength of the lens and with the alteration of the angle of crossing their axes. The models were made at his suggestion by Mr. C. F. Prentice of New York. Diagrams were exhibited showing by geometrical construction how it was possible to tell the course of any given ray after its refraction by any two cylinders of differing power and at any angle of crossing of their axes. A formula applicable to any axis of crossed cylinders calculated by Mr. Prentice was also shown.

Dr. B. Alex. Randall, Philadelphia, exhibited some drawings showing anomalous outgrowths upon the optic disk, and also drawings of anomalies of the retinal vessels.

Designation of Prisms by their Refractive Power, by Dr. Edward Jackson, Philadelphia.

The author pointed out the inconveniences and errors arising under the present method of designating the strength of prisms, and recommended their designation by their refractive power, as much more accurate.

A committee consisting of Drs. H. D. Noyes, Edward Jackson and Swan M. Burnett, was appointed to take the matter into consideration and report at the next meeting.

Extraction of a Partially Absorbed Calcareous Lens, by Dr. David Webster, New York.

March 15, 1888, C. C., æt. 23, consulted Dr. Agnew and the author, at Manhattan Eye and Ear Hospital. She had phthisis bulbi of left and in the right eye were the calcified remains of a mostly absorbed lens, with a discolored atrophic looking iris attached to the membranous mass by numerous adhesions. Visual field good. V=fingers at 2 feet. The vision of left eye had been lost through a blow with a whip at the age of two years. A catarrh developed in the right eye some time afterward. Seven years ago, (1881), her sight having been lost four months, both eyes were operated on by a surgeon in another city, several times. Violent imflammation followed one or more operations on each of the eyes. Eighteen months ago another needling was done by another surgeon, by which sight was somewhat improved. The atrophic eye of late has been painful and tender on pressure. March 16, Dr. Agnew enucleated the atrophic eyeball. A calcific plate was found in the choroid and a small calcareous lens. While the patient was still under ether, he did an iridectomy on the right eye. April 27, Dr. Webster divided with Knapp's knife-needle two or three of the adhesions which were on the stretch. At least one could be heard to snap when cut. An attempt to penetrate the thinnest looking portion of the membranous mass failed. There was considerable effusion of blood which was soon absorbed.

May 14, an attempt to remove the pupillary obstruction with a sharp hook failed, very little reaction.

June 6, with a keratome bent on the flat a wound was made as for iridectomy on the supero-nasal corneal border. The pupillary obstruction was drawn out and cut off close to the cornea, not a drop of vitreous escaped. There was some pain in the eye for 3 or 4 hours, probably the reaction from cocaine. Four days later pain again appeared and was relieved by iced cloths.

June 18, fundus normal, no floating bodies in the vitreous, but the remaining portion of the pupillary membrane, which by the way, was very thick and so tough that the iris scissors would scarcely cut it, extends backward horizontally and flaps up and down with the movements of the eye.

June 22, V=$^{20}/_{XX}$ with —$^{1}/_{32}$. Reads Jaeger's No. 1 with +$^{1}/_{2.25}$. June 26, discharged wearing the above spectacles.

Dr. Samuel Theobald, Baltimore, exhibited an unusually long cilium. The hair was over an inch in length, and was removed from the eyelid of a young lady suffering with some conjunctival irritation, the other cilia were of the usual length.

The officers for the ensuing year are: President, Dr. W. F. Norris, Philadelphia; Vice-President, Dr. Hasket Derby, Boston; Corresponding Treasurer, Dr. J. S. Prout, Brooklyn; Recording Secretary, Dr. Samuel B. St. John, Hartford.

It was decided to hold a special meeting for the consideration of scientific matters only, Sept. 19, 1888, at the Arlington Hotel, Washington, D. C.

The regular meeting will be held the third Wednesday, in July at the Pequot House, New London, Conn.

Adjourned.